DOCUMENT RESUME

ED 109 627 IR 002 143

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TITLE	User's Guide to Batch Processing of OpScan 100 Scan Sheets.
INSTITUTION	Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, Calif.
REPORT NO	SWRL-TN-5-72-28
PUB DATE	25 Apr 72
NOTE	26p.
EDRS PRICE	MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS	*Computer Programs; Data Processing; *Electronic Data Processing; *Information Systems; Input Output Devices; Magnetic Tapes; Management Systems; Recordkeeping; Tests; *Test Scoring Machines
IDENTIFIERS	IMS; *Instructional Management System; Mark Sense Readers; Offline Systems; OpScan

ABSTRACT

An OpScan 100 optical scanner was used to score test materials received at the Southwest Regional Laboratory (SWRL) during the tryout of SWRL's Instructional Management System (IMS). Once a tape had been produced by the optical scanner, it was interpreted and edited by a series of computer routines which prepared the data for further processing by IMS. This document described the entire sequence of data submission, interpretation, and conversion. Error message reports produced by the programs are described, and examples of the input forms for the optical scanner are provided. (DGC)

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SWRL

SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

DATE: April 25, 1972

NO: TN 5-72-28

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Batch processing of OpScan 100 Scan Tapes is performed on the 690 System in IMS ComSys 1 and 2. Described are the operating procedures, scan sheet formats handled, and the messages printed.

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USER'S GUIDE TO BATCH PROCESSING OF OPSCAN 100 SCAN SHEETS

John Yu

Batch processing of OpScan 100 scan sheets starts with receipt of mark reader scannable sheets from schools by mail or courier service as defined in IMS ComSys 1 and 2 (TN 5-72-03). The sheets are then scanned by the OpScan 100 Mark Reader and scan sheet images are produced onto an OpScan Scan Tape. Throughout this guide the term "scan sheet" is used to refer to scan sheet tape images rather than the physical sheets themselves. OPSN, the 690 IMS ComSys 1 and 2 input processor interprets the scan tape images and produces card image records onto another tape. The card image records are then in a form that can be transmitted to IMS resident programs at UCLA via RJS. This guide describes the operation of OPSN, its alternate input mode (teletype), the interpretation of error messages produced by OPSN, the listing of the OpScan 100 Scan Tape and the card image tape, and the types of OpScan 100 scan sheets that can be processed.

OPSN PROGRAM DESCRIPTION

The current version of OPSN can handle six types of sheets designed for the OpScan 100 (see Appendix for the format of the sheets and the manner in which each type of sheet is recognized). There are two modes of inputs: teletype input and tape input. Input tape must be created with LOW (556 BPI) density and EVEN parity. The input tape must be on unit 2 with no write ring, and there must be an end-of-file (EOF) at the end of all logical records: a logical record being the image of a scan sheet. Teletype input can be used to delete or add new students to the IMS data base.

There are two modes of outputs: printer output and magnetic tape output. The printer output is a log of classes processed and error messages. These error messages indicate scan sheet errors detected by OPSN. Magnetic tape output is in HIGH (800 BPI) density and ODD parity. It must be mounted on unit 3 with a write ring. One logical record is one card-image of packed XS40 characters.

Input Sequence

After OPSN is loaded in the 690 System, the operator is requested to provide the header information using the teletype. Header information consists of a six-digit date, four-character tape identifier and a four-digit time-of-day. It is used to identify the magnetic tape output and the printer output.

Header Information. OPSN types out DATE= and waits for operator response. Response must be a six-digit date, two digits for each of month, day, year in that order. No carriage return is needed. OPSN then types TAPE ID=. Response must be at least one but less than five characters, no carriage return is needed for four characters. For less than four characters, the tape identifier is right-justified. Then OPSN types TIME=, response is optional, maximum being four numeric digits. No carriage return is needed for four digits, output is left-justified.

Teletype Input Option. After the header information is given, OPSN types out TELETYPE INPUT? If operator response is N, teletype input section will be skipped and OPSN starts the tape input section. If teletype input is desired, operator response must be Y, this causes a

bell to ring and OPSN waits for teletype input. A teletype input record is typed characters (at least one) up to a carriage return or line feed; the rest of the card image is blank filled. A RUBOUT causes a back slash (\) to be typed and the last typed character deleted. A back arrow (←) deletes a typed line. Excess RUBOUT's act as a back arrow. A (CONTROL I) causes ten spaces to be typed on the teletype and the next character typed starts at the 41st column of the card-image. If 40 or more characters have already been typed on the line, (CONTROL I) causes a back arrow to be typed and its acts as a back arrow. (CONTROL L) terminates the teletype input section; the message TAPE INPUT is then typed and the tape input section starts.

Tape Input Section. OPSN starts off the tape input section by typing the message TAPE INPUT. It then reads the scan sheets on tape 2 and processes them until an end-of-file is encountered.

Output

The magnetic tape output and line printer output are produced simultaneously.

Tape Output. Tape output is in logical records, each record is a one card image of the scores of a student, or contains class identification information. For FYCSP Criterion Exercise Response Sheets and LMS-HR3 Criterion Exercise Response Sheets, one output logical record corresponds to one page of the sheet. For the other LMS Criterion Exercise Response Sheets, one output logical record corresponds to one student, so that one sheet may result in more than one output record. No error checking is done on IMS Class Identification Sheets. Student response sheets are

checked for the following errors: a student response sheet having a page number which does not exist in the specified test format table (test format table is uniquely determined by program number and unit number); a student response sheet having either a program number or unit number which is not found in the program number table or unit number table. If any of these error conditions is detected, only the top row of the sheet is put out as a logical record and an error message is printed out on the printer. The first record of the tape contains header information, the rest of the tape is class identification and student data records. OpScan 100 records are identified by their site ID being set to 10. An end-of-file marks the end of all logical records.

Line Printer Output. The printer log is identified by the header information. Each Class Identification Sheet is printed out in the same format as it is put onto tape. There are two types of error messages. For a student response sheet with an illegal page number, the message is ILLEGAL PAGE #, TOPROW SSPPUUG where SS stands for a two-digit student number, PP stands for a two-digit program number, UU stands for a two-digit unit number and G is a one-digit page number. For a student response sheet having an illegal program number or unit number, the message is ILLEGAL TEST FMT#, TOPROW SSPPUUG. At the end of a class (as defined by the encounter of another Class Identification Sheet) the number of student logical records written to tape and the number of sheets processed for the last class is printed.

Scan Sheet Formats

OPSN presently handles the following type of sheets (see Appendix for format):

(1) IMS Class Identification Sheet

(2) FYCSP Criterion Exercise Response Sheet

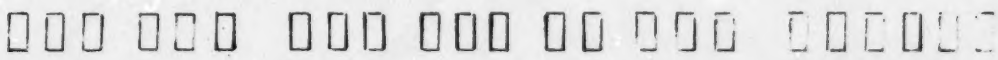
(3) LMS Criterion Exercise Response Sheet, Format A

(4) LMS Criterion Exercise Response Sheet, Format B

(5) LMS-HR3 Criterion Exercise Response Sheet, Format A

(6) LMS-HR3 Criterion Exercise Response Sheet, Format B

All of these sheets have an identical top row format:



The first three fields: PUPIL CODE, PROG.(program) CODE and UNIT CODE are ANY/ALL fields, PAGE CODE is a numeric field (darkest mark selection). A Class Identification Sheet can be used for either of two functions: class identification and student updating. A Class Identification Sheet used for Class ID purpose has the top row completely blank. When the sheet is used for student updating the leftmost position of the PROG. CODE field is marked. A FYCSP Criterion Exercise Response Sheet uses all the fields of the top row, whereas a LMS Criterion Exercise Response Sheet has the PUPIL CODE field as blank and the PAGE CODE is used as a list number. A LMS-HR3 Criterion Exercise Sheet has a blank PAGE CODE. The way each sheet is identified will be described in detail in the program documentation of OPSN. In general, a student

response sheet is identified by its program code, unit code and page code. New sheets designed for the OpScan 100 must use the top row format specified above.

OPSN Operation Instructions

(1) Mount the OpScan 100 Scan Tape on tape drive unit 2, ring off. Tape 2 must be at beginning of tape (BOT) and ON-LINE.

(2) Mount the output tape on tape drive unit 3, ring on. Tape 3 must be ON-LINE. Make sure that the switches are uniquely set.

(3) Ready line printer.

(4) Load OPSN.

The following are the teletype interactions:

DATE=MMDDYY where MM is (Month Month)
DD is (Day Day)
YY is (Year Year)

TAPE ID=TXXX where XXX is the tape number of the output tape on tape drive unit 3

TIME=HHMM where HH is (Hour Hour)
MM is (Minute Minute)

(5) OPSN then types

TELETYPE INPUT?

response must be either of the following:

Y if teletype input is desired

N if teletype input is not desired

(6) If the response to step 5 is Y, a bell will ring, teletype input may then proceed. The following are the control characters:

(CNTRL I)	results in 10 spaces on the TTY, characters typed in after this goes in the card-image record starting from the 41st column.
RUBOUT	results in a (\) on the TTY, deletes last typed character.
←	deletes the current line.
CR or LF	terminates one card-image record
(CNTRL L)	terminates the teletype input section

(7) If in step 5, the response is N, or if step 6 is terminated by a (CNTRL L), OPSN then types

TAPE INPUT

and it starts to process the OpScan 100 tape.

(8) On encountering an EOF on the OpScan 100 tape, OPSN writes an EOF on the output tape and returns to monitor.

OPSN Teletype Error Messages and Corrective Actions

There are two types of error messages: operational error messages and scan sheet error messages. Operational error messages alert the operator of problems detected during operation, and are logged on the teletype. Scan sheet error messages inform the operator of errors detected in the scan sheets and are printed on the line printer as part of the run log.

Operational Error Messages

ERROR MESSAGE	POSSIBLE REASON	CORRECTIVE ACTION
SCAN TAPE ERROR	First record of tape 2 is unrecognizable because: 1. Tape 2 may not be an OpScan 100 tape. 2. First record is something other than IMS ID sheet.	OPSN return to monitor by itself. 1. Rescan scan sheets and try again. 2. List tape 2 and give listing and tape 2 to system programmer.
BAD RECORD	A record on tape 2 is longer than 400_8 words. Most likely there is a missing end-of-file (EOF) at end of tape 2, or it is not an OpScan 100 tape.	Do either of the following: 1. Type E to write EOF if printer log appears to be reasonable; tape 2 may have a missing EOF. Then list tape 3 to make sure it is correct. 2. If printer log containing unexpected entries, type (CNTRL C) to return to monitor. Rerun OPSN with correct input tape.
TAPE 2 NOT READY	Tape 2 is not ON-LINE or not at begin-of-tape (BOT).	Set tape 2 to ON-LINE and at BOT. Then type G to continue.
TAPE 3 WRITE RING MISSING	Tape 3 does not have a write ring.	Reload tape 3 with a write ring, then type G to continue.

Operational Error Messages (cont'd)

ERROR MESSAGE	POSSIBLE REASON	CORRECTIVE ACTION
READ ERR	Parity-error detected while reading tape 2.	1. Exit by typing (CNTRL C), then either clean tape 2 head or use another drive and try OPSN again. If error persists, type E on encountering another READ ERR, then list tape 3 using MLST and give tape 2 with listing to system programmer. 2. Rescan scan forms and rerun.
WRITE ERR	Parity-error detected while writing tape 3.	Exit by typing (CNTRL C), then either clean tape 3 head or use another drive and try OPSN again. If error persists, mark tape 3 and try again using another tape. If error still persists with all three drives, notify system programmer.

OPSN Printer Log and Error Messages

The first line after the header information contains column labels:

Col 1		Col 41								Col 61
PT	UP	DI	SC	TE	G	C	YE	MO	DY	NAME
PORT	UPDATE	DIST	SCHOOL	TEACH	GRADE	CLASS	YEAR	MONTH	DAY	STUDENT

If there is a one-digit number in front of a student name (Column 60), it is a new group number for that student. Error messages in the printer output are indented and will have the top row information of the sheet containing the error. It is typed as TOPROW SSPPUUG where

SS is the student ID

PP is the program number

UU is the unit number

G is the page number

TO LIST OUTPUT TAPE (TAPE 3)

If a listing of tape 3 is desired after OPSN finishes operation, perform the following sequence of steps:

1. Rewind tape 3 to LOAD point
2. Go to top-of-form on line printer
3. Load MLST
4. When MLST types 'UNIT?' answer with '3'

   UNIT?3

5. When MLST types 'CODE?' type X

   CODE?X

6. MLST types 'EOF' on encountering an end-of-file. Type (CNTRL C) to return to monitor.

A detailed description of the operation instructions for MLST can be found in the 690 HANDBOOK.

TO LIST AN OPSCAN 100 TAPE (TAPE 2)

To list an OpScan 100 tape, perform the following sequence of actions:

1. Type (CONTROL C) to get to monitor (indicated by a period), set console switches to 7600.

2. Mount the OpScan tape on any of the tape drives ON-LINE and at LOAD.

3. Set the switch for the tape drive used to zero, and make sure no other tape drive switch is set to zero.

4. Press the LOW button for density, EVEN button for parity.

5. Type HLT and a carriage return.

6. Type MDIG and carriage return, then press START at the console. The tape is now read. If EOF is encountered before the buffer is filled, the program will return to monitor. If the buffer is filled before EOF is encountered, MDIG will halt at location 232.

7. If MDIG halts at Location 232, press LOAD ADD and then START at the console to get back to monitor, otherwise proceed with next step.

8. Type ODTH and carriage return at the keyboard. Then type 33/, ODTH will type out the upper limit of the buffer the tape is read into.

9. Type 7600G to get back to monitor.

10. Type DMPC and carriage return, it should come back with *-, at this point, type 400 and carriage return.

11. To the second *-, respond with upper limit you get in step 8. The core locations will be listed on the line printer.

12. When DMPC comes back with *- on the teletype, type (CNTRL C) to get back to monitor. If MDIG returns to monitor as step 6, the whole tape is listed to the first EOF. To continue listing the tape, go back to step 5.

13. Be sure to reset the density and parity switches to REMOTE when everything is finished.

APPENDIX

SCAN SHEETS FOR OPSCAN 100
AND THEIR IDENTIFICATION

The following is a description of the different OpScan 100 sheets and their distinguishing characteristics. A sample sheet is attached for each type.

1. Class Identification Sheet (used for class ID purpose)

   An ID sheet is defined to be a sheet whose top row is blank. It contains the following information and the card image output of such a sheet has the following format:

COL	CONTENT
1-2	Port Number
3-40	Blank
41-42	District Number
43-44	School Number
45-46	Teacher Number
47-49	Blank
50	Grade Number
51	Blank
52	Class Number
53-54	Year
55-56	Month
57-58	Day
59-80	Blank

2. Class Identification Sheet (used for student update purpose)

   This sheet is similar to a class ID sheet. It is defined to be a sheet having blanks in all entries in the first row except the left-most grid of the program code field.

COL	CONTENT
1-2	Port Number
3-4	Blank
5-6	Contains a program number (indicating that it is used for update)
7-40	Blank
41-42	District Number
43-44	School Number
45-46	Teacher Number
47-49	Blank

COL	CONTENT
50	Grade Number
51	Blank
52	Class Number
53-54	Year
55-56	Month
57-58	Day
59	Blank
60	Group Number
61-80	Name of Student

IMS CLASS IDENTIFICATION SHEET

TEACHER SIMMONDS

PRINT THE NEW PUPIL'S LAST NAME FIRST, SKIP A BOX, THEN PRINT HIS FIRST NAME IN THE BLOCKS PROVIDED BELOW.

PUPIL NAME:

PRINT THE DATE OF TESTING OR ADDING A NEW PUPIL IN THE BLOCKS BELOW

DATE:	MONTH	DAY	YEAR
			19
JAN	0		71
FEB	1		72
MAR	2		
APR	3		
MAY	4		
JUN	5		
JLY	6		
AUG	7		
SEP	8		
OCT	9		
NOV			
DEC			

IF A NEW PUPIL IS TO BE ADDED TO THE CLASS, MARK THIS BOX

MARK THE NEW PUPIL'S GROUP NUMBER (OPTIONAL) 1 2 3 4 5 6

Class Identification Sheet

3. FYCSP Criterion Exercise Response Sheet

The format of this sheet is defined by the program code and unit code. This sheet is identified by the value of 01 for the program code field.

COL	CONTENT
1-2	Port Number
3-4	Student ID
5-6	Program Number
7-8	Unit Number
9	Page Number
10	Delete Field, 1 for delete
11	Blank
12-39	Item Responses
40-80	Blanks

FYCSP Criterion Exercise Response Sheet

PUPIL CODE 1 2 3 4 5 6

DELET

FYCSP UNIT 10

1

PUPIL NAME _____

	1	wish	fish	was
	2	but	bus	his
	3	ant	and	that
	4	said	had	Sid
	5	us	his	has
	6	un	an	en
	7	w	r	b
	8	f	l	h
	9	et	en	ell
	10	ill	ell	it

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PUPIL CODE 1 2 3 4 5 6

FYCSP
UNIT 10

2

	11	bit	bed	hit
	12	bee	feed	feet
	13	fun	run	bun
	14	sell	fill	sill
	15	Ben	hand	hen
	16	Q	d	j
	17	W	v	x
	18	R	K	H
	19	M	N	w
	20	U	v	y

4. LMS Criterion Exercise Response Sheet, Format A

Format A is used for Units 1-11 of HR1, or Units 1-8 of HR2, or Units 1-13 of MBS. LMS sheets are characterized by the program code having a value of 02, 03, 04 or 05. Since each LMS sheet contains more than one student's scores, the student numbers of each sheet is stored in a table. Each student's scores take up a card image record of the following format:

COL	CONTENT
1-2	Port Number
3-4	Student ID
5-6	Program Number
7-8	Unit Number
9	Blank
10	Delete Field, 1 for delete
11	Tested Field, 1 if tested
12-39	Student Response
40-80	Blanks

5. LMS Criterion Exercise Response Sheet, Format B

Format B has exactly the same output format as Format A. Format B is used for Units 12-15 of HR1, or Units 9-15 of HR2.

LMS Criterion Exercise Response Sheet

Format A

LIST NUMBER

HARPER & ROW
GRADE 1

UNIT

2

IMS
CRITERION EXERCISE
RECORD SHEET

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LMS Criterion Exercise Response Sheet

Format B

LIST NUMBER

HARPER & ROW
GRADE 1

UNIT

14

IMS
CRITERION EXERCISE
RECORD SHEET

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6. LMS-HR3 Criterion Exercise Response Sheet, Format A

Format A of this sheet has two parts, Part I and Part II, 10 questions per part. No page code is used. Format A is used for Units 1-8 of HR3. The output has the following format:

COL	CONTENT
1-2	Port Number
3-4	Student ID
5-6	Program Number
7-8	Unit Number
9	Page Number (set to one)
10	Delete Field, 1 for delete
11	Blank
12-39	Item Responses
40-80	Blank

The item responses are not arranged into Part I and Part II, but rather, Part I and Part II item responses are alternated.

7. LMS-HR3 Criterion Exercise Response Sheet, Format B

Format B has the same form as Format A of HR3, but Part II is not used. Format B is used for units 9-16 of HR3. The output has the same format as that of HR3 Format A with the scores for Part II all zeroes.

LMS-HR3 Criterion Exercise Response Sheet

Format A

PUPIL CODE

DELETE

NAME _____

IMS

CRITERION EXERCISE

SHEET

UNIT

3

LMS-HR-3

PART I

1	twenty	jingled	steep	blanket
2	accord	crawled	through	thought
3	feathers	true	business	cage
4	stripes	orange-colored	screeching	folded
5	platform	shade	bowls	weaver
6	ragged	mountain	papa	stall
7	river	worth	jars	six
8	fine	such	steep	kind
9	shade	tears	visit	poor
10	true	thought	excited	stall

PART II

1	dew	sorely	foremost	crewmen
2	whale	spin	store	pale
3	scrap	dewdrop	tray	stew
4	bales	sore	crew	stores
5	sale	float	blew	scream
6	crewmen	whalebone	stewed	screaming
7	scrappy	males	blew	core
8	trashy	guile	stew	screw
9	Core	Stew	Scrub	Ball
10	Whales	Guestroom	Reheat	Wrap

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LMS-HR3 Criterion Exercise Response Sheet

Format B

PUPIL CODE

DELETE

NAME _____

IMS

CRITERION EXERCISE

SHEET

UNIT

9

LMS-HR-3

PART I

	charge	survey	chairman	reach
1				
	enjoy	messages	dismissed	organize
2				
	vote	president	thump	modern
3				
	record	paid	meant	fourteen
4				
	formed	imagine	include	ancient
5				
	paragraphs	tests	pals	pens
6				
	club	record	purpose	hamster
7				
	survey	several	formed	charge
8				
	charge	tradition	imagine	vote
9				
	vice-president	ancient	neighborhood	pronounced
10				

PART II

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

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